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Adverse health effects of selenium in humans.

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Abstract

Epidemiologic studies and case reports have shown that chronic exposure to selenium compounds is associated with several adverse health effects in humans. An early toxic effect of selenium is on endocrine function, particularly on the synthesis of thyroid hormones following dietary exposure of around 300 micrograms Se/d, and on the metabolism of growth hormone and insulin-like growth factor-1. Other adverse effects of selenium exposure can be the impairment of natural killer cells activity and at higher levels, hepatotoxicity and gastrointestinal disturbances. Dermatologic effects, such as nail and hair loss and dermatitis, occur after exposure to high levels of environmental selenium. Assessing the toxicity and morbidity after long-term exposure to environmental selenium is difficult: neurotoxicity, particularly the degeneration of motor neurons leading to increased risk of amyotrophic lateral sclerosis, might occur after chronic exposure to both organic and inorganic selenium compounds. The results of laboratory investigations and cohort studies suggest that selenium species exhibit a bivalent effect in cancer, either increasing or decreasing risk. Current environmental selenium exposure limits appear to be inadequate for averting adverse health effects.

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